# KEYS TO THE FLORA OF FLORIDA - 28, *IRIS* (IRIDACEAE)

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## ABSTRACT

*Iris* (Iridaceae) is represented in Florida by 8 species, one with two varieties. Most species are rare; none is endangered. All but one are native. *Iris savannarum* is endemic. *Iris pseudacorus* shows potential for becoming invasive. Differences between *I. brevicaulis*, *I. hexagona*, and *I. savannarum* are discussed. ***Iris savannarum*** var. ***kimballiae*** is recognized as a new combination and a lectotype is designated. A neotype for *I. brevicaulis* is selected. One species reported for Florida is excluded. An amplified key is given to the Florida taxa. *Phytologia 93(2): 231-240* (August 1, 2011).

**KEY WORDS:** *Iris*, Iridaceae, Florida flora.

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By their beauty and ease of cultivation, species of *Iris* (Iridaceae) have long been popular in horticulture. A distinctive floral structure permits their immediate recognition to genus. But subtle, often hidden differences in their morphology have long contributed to misidentifications and misunderstandings among the species. The present study builds upon a substantial base of prior knowledge of the Florida irises. Yet for certain species there is still need for close reporting of their Florida distribution and clarification of floral structures.

Any mention of *Iris* in the Southeast immediately evokes recollection of an anomaly of American taxonomy: the designation of 98 "species" of iris (J. K. Small & E. J. Alexander, Contr. New York Bot. Gard. 327: 325-357. 1931; Small, Manual S.E. Flora. 1933) in an area where perhaps no more than a half-dozen species had previously

been acknowledged. Most of these finely differentiated entities were described from the Louisiana marshes. The type locality for many, near Kraemer, Lafourche Parish, was destroyed soon after their publication. But their presence in the literature has stimulated later workers either to discredit their existence or to make claims of similar hybrid swarms elsewhere. Publications attempting to clarify these many forms include: an assortment based upon their chromosomal numbers and forms (R. C. Foster, Contr. Gray Herb. 119: 3-82. 1937), an analysis of the separating characters (H. P. Riley, Amer. J. Bot. 25: 727-738. 1938; Amer. Iris Soc. Bul. 74: 3-7. 1939), and "negative" evidence of introgression among the species (L. F. Randolph, I. S. Nelson & R. L. Plaisted, Cornell Agric. Exp. Sta. Mem. 398: 3-56. 1967). These Louisiana-centered studies did not directly impact Florida botany except insofar as Florida species were represented. These are *I. brevicaulis* Raf., a Mississippi basin species whose range extends eastward to Florida, and *I. giganticaerulea* Small, a Louisiana endemic closely related to Florida's *I. savannarum* Small.

Magnificent color plates of five presumed species, two of them Florida endemics (*I. kimballiae*, *I. savannarum*), were published by J. K. Small (Addisonia 9: 51-60. 1925; ibid. 12: 11-12. 1927). A floristic treatment of Florida species (as part of his report of all North American irises) has been prepared by N. C. Henderson (Fl. N. Amer. 26: 371-395. 2002).

Florida species of *Iris* fall within subgenus *Iris*, section *Pogiris*, subsection *Apogon*, series *Hexagonae* (*I. brevicaulis*, *I. fulva*, *I. hexagona*, *I. savannarum*), series *Laevigatae* (*I. pseudacorus*, *I. virginica*), series *Tripetalae* (*I. tridentata*), and series *Vernae* (*I. verna*), as classified by G. H. M. Lawrence (Gent. Herb. 8: 346-371. 1953). They may more usefully be divided into two groups by the form of their tricarpellate ovaries (and capsules). *Iris pseudacorus* L., *I. tridentata* Pursh, *I. verna* L., and *I. virginica* L. have carpels that remain externally visible and form 3 more or less distinct lobes or angles in the mature capsule, and rupture along a median suture in each carpel. Of these 3-lobed (*I. pseudacorus*) or 3-angled species, *Iris verna* occurs in dry woodlands; its habitat, and its slender cord-like rhizomes, are

distinctive. *Iris tridentata* is a plant of acid bogs, with unique one-flowered inflorescences and reduced petals. *Iris virginica* is marked by the several prominent veins in each blade and wholly herbaceous spathes.

*Iris pseudacorus*, the only introduced species, is the most robust -- and only yellow-flowered -- member of the Florida iris flora. Wherever it has become established it seems to spread inexorably by its sturdy rhizomes, forming dense stands that preclude other wetland species. Eradication efforts have been reported in retention ponds in Jackson County (Wildland Weeds 8: 12-13. 2005). But the few places where it is presently known have been insufficient to justify its formal ranking as an invasive species (fleppc.org, 2009).

*Iris fulva* Ker-Gawl., *I. hexagona* Walt., *I. brevicaulis* Raf., and *I. savannarum* Small bear two longitudinal flanges or ridges (faint, often absent in *I. savannarum*) on each carpel, which mature into a six-angled (or terete) capsule, and rupture irregularly by capsule wall disintegration. *Iris fulva*, by its bronze-red perianth, is outstanding and readily distinguished. It is of western origin; it has been found in Florida at only a single panhandle location. *Iris hexagona*, *I. savannarum*, and *I. brevicaulis* form a scarcely differentiated and poorly understood complex. *Iris hexagona*, the first described, was originally known in lowlands near the Santee River, South Carolina (Walter, 1788). Its outstanding character are the six prominent flanges on the ovary, maturing into a hexagonal capsule with six concave faces. Its present range is difficult to determine since herbarium materials are too often ambiguous. Henderson (2002: 392) reported *I. hexagona* to occur in Florida in only two counties of the northwest peninsula (a distribution confirmed here). He excluded *I. hexagona* from Georgia, thus implying a considerable disjunction from its South Carolina type locality. [Two apparently valid records from southern Georgia (S. B. Jones & N. C. Coile, 1988) seemingly were discounted.] H. H. Hume (Bull. Amer. Iris Soc. 1933) reported *I. hexagona* at three sites, now lost, in Nassau and Duval counties, northeastern Florida. *Iris hexagona* has been applied by some to include *I. savannarum*, a plant intended by its author (Small, 1925) to be restricted to the Florida peninsula, thus

confounding and vastly expanding the apparent distribution of *I. hexagona*.

*Iris brevicaulis* is a western species, common in the Louisiana marshes and northward, only sparingly reaching panhandle Florida. Its striking characteristic are flowering stems much shorter than the leaves, at times no more than 10-15 cm. long. Its capsules are very like *I. hexagona*.

*Iris savannarum* is by far the most abundant iris species in the state, once covering broad areas of Okeechobee prairie, now much reduced by agriculture and drainage but still common. It is the only species of the group without prominent flanges or ridges on the ovary and maturing into capsules circular in cross-section (if longitudinal ridges are present, they are low and inconspicuous, most often not sufficient to cause a cross-section to appear six-sided; but see var. *kimballiae*).

These three taxa show differences that taken as a whole justify specific rank for each. *Iris savannarum* inflorescences commonly overtop the leaves. Its ovaries show little or no longitudinal ribbings, and the capsules are essentially circular in cross-section. *Iris hexagona* inflorescences are usually somewhat shorter than the longest leaves. Its ovaries are prominently ridged longitudinally, and mature into capsules that are sharply hexagonal with each of the six faces concave. *Iris brevicaulis* inflorescences are very much shorter than the leaves with abrupt zigzags at each node. Its ovaries are also ridged and mature into hexagonal capsules.

Habitats also differ. *Iris savannarum* is usually found in standing water or on soils that are often fully saturated. *Iris hexagona*, at least in Florida, occurs on ditchbanks and road shoulders, seasonally wet but not long immersed. And *Iris brevicaulis* is often a plant of moist pastures or woodlands, apparently never flooded.

Botanists have differed in their treatment of these taxa. Small (1925, 1933), the author of *I. savannarum*, was confident they were

distinct species; he was followed in this belief by contemporaries whose interest was perhaps more in their horticulture and distribution (e.g., Hume, 1933). More recent writers (e.g., W. J. Dress, Hortus III. 1976), as well as the present authority (Henderson, 2002), also accepted *I. hexagona*, *I. brevicaulis*, and *I. savannarum* as species. Foster (1937) formed *I. hexagona* var. *savannarum*, though this new combination seems not to have gained traction. Others (e.g. R. P. Wunderlin, Guide to the Vasc. Plants of Florida, 1998) went a step further, recognizing *I. brevicaulis* and *I. hexagona*, with *I. savannarum* wholly submerged in the latter taxon.

Two names employed in Florida irises -- *I. rivularis* Small (1927), and *I. kimballiae* Small (1925) -- have resisted understanding. *Iris rivularis*, though splendidly illustrated and carefully described, appears to have evaded collection subsequent to its discovery in 1927 (cf. Hume, 1933). Small stated it to occur along streams flowing into the St. Mary's River, the divide between Georgia and northeastern Florida. Its morphology does not differ markedly from that of *I. hexagona* which has been reported in the same area (Hume), and it seems best to treat it as a tentative synonym of that species.

*Iris Kimballiae* presents another, presently unresolved problem. This taxon was given specific rank with its type locality the Apalachicola River delta, in the central panhandle. [Small originally (1925) reported this from both Apalachicola and northeast Florida, but later (1933) restricted it to the western station, the northeastern plants becoming his *I. rivularis*.] Small, on a July trip (J. N.Y. Bot. Gard. 31: 272-277. 1930), collected "ripe perfect capsules" of his *I. Kimballiae* for the "first time" (thereby giving credence to his description (1933) of them as "ellipsoid or oval, 5-9 cm. long, bluntly 6-sided"). Soon after, Hume (1933) on a March trip found flowering *I. Kimballiae* at eight locations near the town of Apalachicola. Foster (1937) also knew the plant; he excluded *I. fulva* as a possible parent, and reported its chromosomes to be like *I. brevicaulis* and *I. giganticaerulea* (of Louisiana) but with 2n=42 rather than their 2n=44.

Hume's description of habitat and exact locations of *I. Kimballiae* and Foster's chromosome counts constitute the great bulk of

what is known of this taxon. Later authors, even though in some cases based not far from its type locality, seem wholly unfamiliar with it, either placing the name in synonymy under *I. hexagona* (Wunderlin, 1998; Wunderlin & Hansen, 2003) or disregarding it entirely (Godfrey & Wooten, 1979; Clewell, 1985). Since Small's description (especially its capsule) is in closer accord with *I. savannarum* than with other possible allies, lacking further knowledge, placement of *I. kimballiae* under *I. savannarum* seems justified. But its morphology (as well as its range) demonstrates differences from that species; varietal rank is indicated and a new combination is required.

***Iris savannarum*** J. K. Small var. ***kimballiae*** (J. K. Small) D. B. Ward, comb. et stat. nov. Basionym: *Iris Kimballiae* J. K. Small, Addisonia 9: 59-60, plate 318. 1925. TYPE: U.S.A. Florida: Franklin Co., swamp, Apalachicola, 1921. Specimens prepared June 1923. Three-sheet LECTOTYPE (*Small 49912*, *49917*, *49918* - NY) designated here.

Typification of *Iris Kimballiae* was handled somewhat irregularly. Best as can be determined, in 1921 Winifred Kimball, resident of Apalachicola, sent living material to Small, which was placed in the NY "propagation house." In June 1923, Mary E. Eaton, from flowering material, painted the illustration later published in Addisonia. Apparently also in 1923, three specimens were prepared from the living plant and were labeled by Small as from Kimball and "Swamp, Apalachicola, Fla." Small (his handwriting) assigned them his collection numbers 49912, 49917, and 49918. In July 1924, Small visited the Apalachicola site and made two collections (NY). At publication of *I. Kimballiae* (Addisonia, 1925), Small remarked that "type specimens...are in the [NY] herbarium." In 1985 A. F. Cholewa (NY) annotated the three Kimball specimens as syntypes and noted that Small had not indicated which was to be the type. Small's original material thus consisted of three specimens from greenhouse materials, two collections from Apalachicola, and the color plate published in conjunction with his new name and protologue. Here, the three specimens prepared from the Kimball plant are considered a three-sheet lectotype.

A detail of typification remains unaddressed. Foster (1937) apparently was the first author to equate the previously overlooked *Iris brevicaulis* Raf. (Florula Ludoviciana, 20. 1817) with the formerly widely used *I. foliosa* Mack. & Bush (Trans. Acad. Sci. St. Louis 12: 80-81. 1902). Foster noted the similarity of the two descriptions left "no doubt" that Rafinesque and MacKenzie & Bush were addressing the same plant. But there was still room for uncertainty; Rafinesque had prepared his *Florula* by editing and translating (from the French) a detailed but amateurish description of Louisiana plants by C. C. Robin (1807). Since Rafinesque never saw whatever specimens Robin may have had, his names are without types. To remove doubt as to the form represented by Robin's plant, and to avoid any possibility of conflict between the two names, the type for *I. brevicaulis* selected here is the same specimen as that designated by MacKenzie & Bush for their *I. foliosa*.

*Iris brevicaulis* Rafinesque, Florula Ludoviciana, p. 20. 1817. NEOTYPE, selected here: *K. K. MacKenzie & B. F. Bush s.n., 6 June 1897 (MO)*, Little Blue Tank, Jackson Co., Missouri, U.S.A. This is also an isotype of *Iris foliosa* Mack. & Bush, Trans. Acad. Sci. Soc. St. Louis 12: 80-81. 1902. ["Little Blue Tank" was a steam-locomotive water-supply tank at railroad crossing near Little Blue Spring, s.e. edge of Independence, Mo.]

**IRIS** L. Irises, Flags[1]

1. Flowers yellow; central mark of sepals sharply margined; capsules strongly 3-lobed in x-section, each lobe with groove along crest; plants tall. Perennial herb, to 2 m. Open marshes, wooded sloughs. Western and central panhandle (Escambia, Jackson, Leon counties), northern peninsula (Alachua Co.); rare. Spring. Appearing invasive, but not yet so classified.
YELLOW IRIS. *** Iris pseudacorus** L.

1. Flowers reddish brown or blue to purple; central mark of sepals shading into blade; capsules ± 3-angled (*I. verna*, *I. tridentata*, *I. virginica*), or terete to 6-angled in x-section.

2. Flowers coppery red to bronze; petals much shorter than claw of the sepals; capsules 6-angled. Perennial herb, to 1 m. Shallow water of riverside swamp. Western panhandle (Santa Rosa Co.); rare. Spring.
COPPER IRIS. **Iris fulva** Ker-Gawl.

2. Flowers blue to purple (rarely white); petals equal to or longer than claw of the sepals.

3. Plants small, the leaves <15 cm. long, 0.5-1.0 cm. broad; rhizomes slender, cord-like; perianth fused basally into a long (3-5 cm.) slender tube; petals violet; sepals violet with papillose yellow central band; xeric. Perennial herb, to 0.2 m. Dry sandy woodlands. Western panhandle (Escambia, Santa Rosa counties); rare. Spring. [*Neubeckia verna* (L.) Alef.]
DWARF IRIS. **Iris verna** L. var. **smalliana** Fern.

3. Plants larger, the leaves 20-50 cm. long; rhizomes stout; perianth fused basally into a very short (<1 cm.) tube; mesic to hydric.

4. Petals small and inconspicuous, scarcely longer than claws of the sepals; inflorescence usually one-flowered. Perennial herb, to 0.6 m. Seepage bogs. Central panhandle (Bay to Wakulla counties), disjunct east to northeast Florida (Duval Co.); rare. Spring. [*Iris tripetala* Walt.] **Iris tridentata** Pursh

4. Petals apparent, at least 2/3 as long as the full sepal; inflorescence usually several-flowered.

5. Leaves with 1-3 prominent nerve-like longitudinal veins; peduncle extended beyond subtending spathes; capsules somewhat 3-angled; spathes (both inner and outer) wholly herbaceous. Perennial herb, to 0.8 m. Marshes, ditches, river floodplains. Central panhandle (Washington Co.), east across north Florida (to Nassau, Duval counties), south to coastal upper peninsula (Taylor, St. Johns counties); rare. Spring.
BLUE FLAG, BLUE IRIS.. **Iris virginica** L.

5. Leaves with all veins of similar prominence; peduncle enclosed within subtending spathes; capsules 6-angled to terete; spathes herbaceous to scarious (the inner often wholly scarious).

6. Ovaries at anthesis circular in x-section, without prominent longitudinal flanges or ridges (or with inconspicuous ridges in var. *kimballiae*); mature capsules mostly >5 cm. long, circular in x-section (or with each of the 3 carpels slightly tumid); leaves usually overtopped by inflorescences. Perennial herb, to 1 m. Spring-summer. Endemic.
PRAIRIE IRIS. **Iris savannarum** Small

a. Mature capsules terete, with or without 6 low longitudinal ridges; petals and sepals narrowly spatulate. Savannas, marshes. Peninsula (n. to Levy, Alachua counties); common (often locally abundant in mid-peninsula, rare or absent in s.e. coast, absent from Keys). [*Iris Albispiritus* Small; *Iris hexagona* var. *savannarum* (Small) Foster]
PRAIRIE IRIS (typical). var. **savannarum**

a. Mature capsules 6-sided; petals and sepals broadly spatulate. Marshy stream banks, sometimes brackish. Coastal mid-panhandle (Franklin Co.); rare. [*Iris Kimballiae* Small]
KIMBALL IRIS. var. **kimballiae** (Small) D. B. Ward

6. Ovaries at anthesis circular in x-section but with each of the 3 carpels bearing two longitudinal flanges or ridges (thus pistil with 6 equal-spaced flanges); mature capsules mostly <6 cm. long, hexagonal in x-section with each face concave (each face corresponding to surface between the 6 former flanges); leaves usually overtopping inflorescences.

7. Flowering stem 60-100 cm. tall, scarcely zigzag, erect, shorter than to nearly equal the basal leaves; usually with single flowers opening in sequence. Perennial herb, to 1 m. Open marshes, ditch banks. Upper western peninsula (Taylor, Dixie counties); rare. Spring. Far-disjunct from its type locality in coastal South Carolina. [*Iris rivularis* Small (?)]
WALTER'S IRIS. **Iris hexagona** Walt.

7. Flowering stem 20-40 cm. tall, sharply zigzag (alternately flexed at each node), often declining, much shorter than and partly hidden by the basal leaves, often with several simultaneous flowers. Perennial herb, to 0.8 m. Open mesic woodlands. Central panhandle (Gadsden, Jackson counties); rare. Spring. [*Iris foliosa* Mack. & Bush.]
ZIGZAG IRIS. **Iris brevicaulis** Raf.

Excluded names:

**Iris germanica** L.
Reported for Jackson Co. (Anderson, 1989; Godfrey 80395 - FLAS, FSU). Not confirmed to be naturalized.

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1. This paper is a continuation of a series begun in 1977. The "amplified key" format employed here is designed to present in compact form the basic morphological framework of a conventional dichotomous key, as well as data on habitat, range, and frequency. Amplified keys are being prepared for all genera of the Florida vascular flora; the present series is restricted to genera where a new combination is required or a special situation merits extended discussion.

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